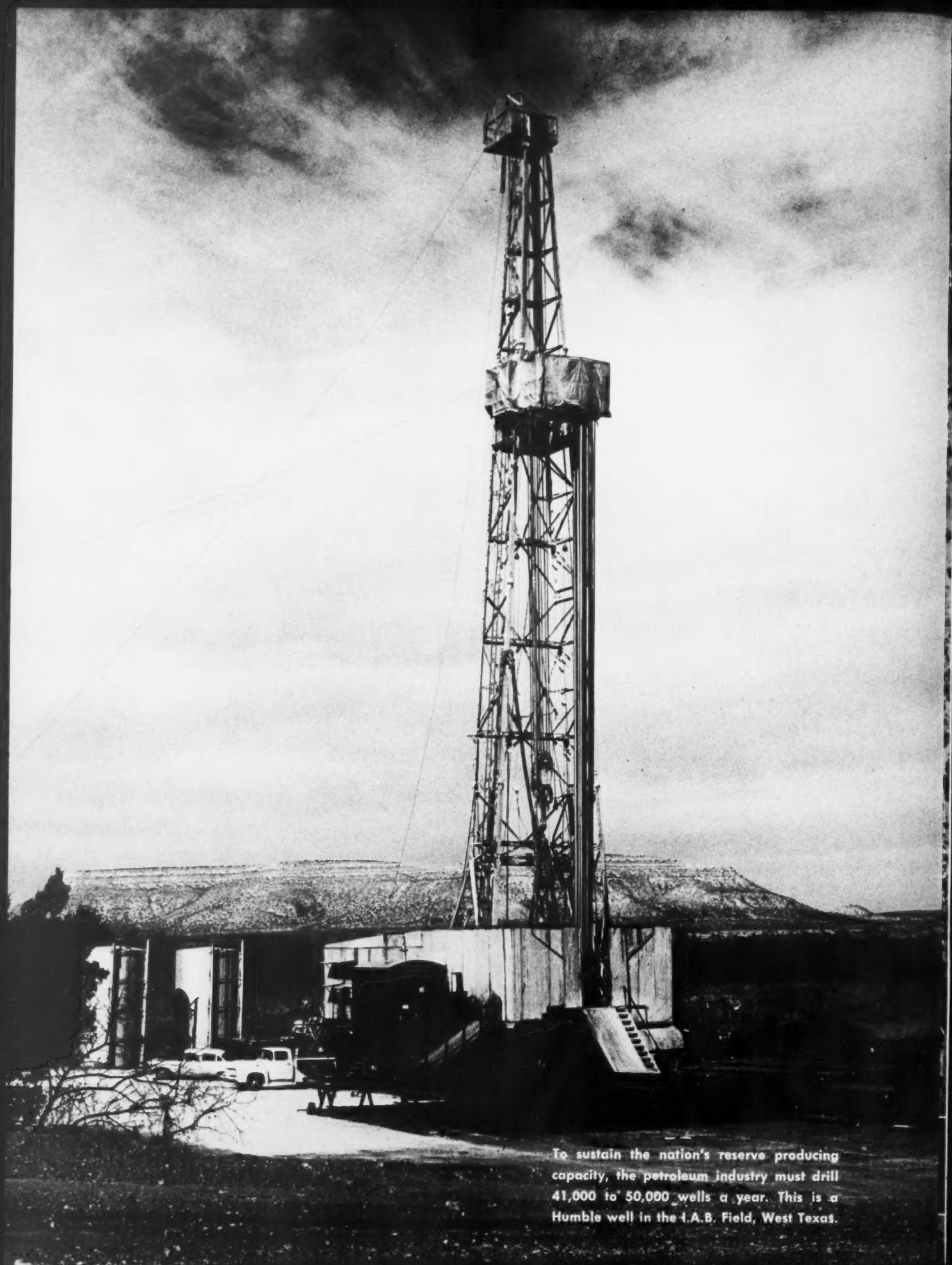
Afternoon on the Pier — *Leslie Anderson*

The Humble Way

JANUARY-FEBRUARY, 1959



To sustain the nation's reserve producing capacity, the petroleum industry must drill 41,000 to 50,000 wells a year. This is a Humble well in the I.A.B. Field, West Texas.

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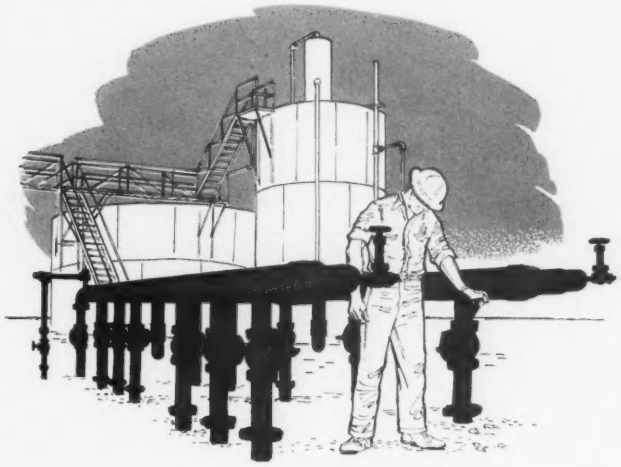


LOOKING TO THE FUTURE

BY C. E. REISTLE, JR., *Executive Vice President*

LAST year was one of serious problems. This was not unexpected, of course. High imports, burdensome inventories, sluggish demand, and other economic factors had begun to affect the domestic petroleum industry even before the year began. Hard on the heels of these adverse developments came a sharp decline in business generally.

The general recession, fortunately, ran its course in a relatively short time. The over-all economy reached a low point about last April and then turned encouragingly upward. The domestic petroleum industry, however, Humble included, continues to feel the effects of its own private recession.

It is estimated, for example, that total demand for petroleum products during 1958 was down about 1.2 per cent from 1957. Domestic demand showed an increase of about 2 per cent, but a reduction in exports more than canceled out that gain. Total demand for 1958 is estimated at 9,272,000 barrels a day. This is 114,000 barrels a day under total demand for 1957.

Over-all operations in the United States have shown an even sharper decline. Crude oil production, for example, is down about 6.5 per cent, or from 7,170,000 barrels a day in 1957 to an estimated 6,703,000 barrels daily in 1958. Refinery crude runs are down about 4 per cent, from 7,919,000 barrels a day in 1957 to an estimated 7,620,000 barrels a day in 1958.

The effort on the part of many companies to reduce inventories of crude and products to a more conservative level has been one factor in this operational decline. In 1957, additions to inventories amounted to 61 million barrels, bringing supplies of crude and products to all-time high levels. It now looks, however, as if inventories dropped about 43 million barrels last year, although gasoline stocks are still quite high in some parts of the country.

Another reason for the slowdown in domestic operations has been the increase in the total imports of crude and products. Under the government's voluntary program, imports of crude oil were reduced somewhat last year: from 1,023,000 barrels a day to 950,000 barrels a day. Imports of products, however, increased sharply: from 551,000 barrels a day in 1957 to 701,000 barrels a day last year. The result has been an increase in total imports of nearly 5 per cent—an increase from 1,574,000 barrels a day in 1957 to 1,651,000 barrels a day in 1958.

The inevitable result has been a downward adjustment in domestic crude oil production, and this downward adjust-

From a talk before a supervisors meeting at Baytown Refinery on December 16, 1958, and before a management meeting in the Houston Office on January 15, 1959.

Mr. Reistle speaks to . . .

"The continued success of Humble depends on our individual efforts. Most certainly there should be no major differences between management and employees insofar as overall objectives are concerned."

ment has hit Texas much harder than it has any other major producing area. Whereas production nationwide is down 6.5 per cent, crude production in Texas is down more than 12 per cent from that of 1957. In 1957, Texas had 171 producing days. The total for last year was 122 producing days.

Refinery runs in Texas have also declined considerably more than the national average. Runs are down 6.7 per cent in Texas as compared with 4 per cent for the nation as a whole.

Effect on Humble's operations

These developments had a sharp impact on Humble's 1958 operations. More than 82 per cent of our oil-producing capacity is located in Texas. The cutback in Texas producing days, therefore, has resulted in about one-sixth less oil production for the Company in 1958 than it had in 1957. Our average gross crude oil production in the Gulf Coast area for 1958 is estimated at 330,000 barrels a day, or less than one-half of our maximum efficient rate of about 729,000 barrels a day.

Our refinery runs during 1958 were at about 80 per cent of capacity, or an average of 228,000 barrels a day compared to 235,000 barrels a day in 1957 and 262,000 barrels a day in 1956. On a percentage basis, our runs were 3 per cent lower in 1958 than in 1957 and 13 per cent under those of 1956.

There have been two bright spots in our operational picture. Natural gas sales increased by about 6 per cent, and retail sales of gasoline by the Marketing Department showed a 3.6 per cent gain.

Our 1958 earnings, as you may have guessed, will be considerably lower than in 1957. The last six months, however, brought an encouraging improvement in operating levels as well as in net income. In terms of an adequate return on the stockholders' investment, our earnings are still considerably smaller than they should be.

In 1958, for the second time in recent years, Standard Oil Company (New Jersey) offered to exchange its stock for Humble stock. As I see it, this exchange of stock will not have any great effect one way or the other insofar as employees or management of the Company is concerned.

Jersey has owned more than 50 per cent of Humble's stock ever since 1919. By around 1940, they owned about 72 per cent. By 1954, they had acquired 88 per cent. Their holdings now amount to more than 98 per cent. As majority stockholder, however, Jersey's legal rights are no different today than they have been for many years.

Jersey, as majority stockholder, will in the future, as in the past, approve Humble's board of directors each year. As provided by our charter, however, Humble's board will continue to elect their officers and will continue to be responsible for the selection of management people and for the operation of the Company.

Personnel surplus problem

Even before the economic recession of 1957, the Company's management knew that it faced an impending surplus of personnel. With the reopening of the Suez Canal, the domestic industry found itself in a rapidly worsening situation.

In the light of business conditions, the Company's management could no longer delay an effort to bring payroll costs into line with curtailed operations. Therefore, we took steps to reduce the personnel surplus, but only on the basis of a plan under which every possible consideration was given to the employees concerned.

. . . management group in Houston Office.

A temporary program of special retirement and layoff allowances was developed and put into effect last February 1. By November 1, the operation of this special program, aided by normal attrition, had reduced the number of employees from 19,513 to 17,708, or 9.3 per cent.

This reduction in personnel, as well as a reduction in our other costs of doing business, was absolutely necessary if the Company was to meet competition and preserve its economic health. All other companies were reducing costs in order to improve their competitive position. Had Humble not done so, our economic situation would have become extremely precarious.

The necessity for increased efficiency and for a further reduction in costs has not ended even yet. In today's fast-moving industrial scene, it is necessary to run fast just to keep up with our competition. As I see it, this is a challenge to each and every employee of the Company. For unless we can hold our own in the open market, we cannot continue very long to be the kind of company that all of us want to be a part of.

Outlook for the industry

Domestic demand, our economists tell us, is expected to increase about 5 per cent in 1959. Part of this anticipated gain, however, must be attributed to the bounce-back from the recent economic recession. Over the long pull, future growth in demand will probably be about three per cent a year, or about the same rate as total energy consumption. This compares with a five per cent rate of growth in past years.

There are several reasons why we can expect the rate of growth in domestic demand to decline. One is that petroleum has probably taken just about all the markets it can away from coal. The markets remaining for coal are those in which it has a price advantage. We may also expect to see oil meeting increased competition from natural gas. In 1957, for example, about 120,000 oil burners were converted to gas. These inroads on heating oil consumption seem likely to continue, and it is possible that by 1963 heating oil consumption will start to decline.

As for gasoline demand, there is little doubt that the trend to smaller automobiles and the decline in the use of automobiles for travel will result in a lower rate of growth than we have had in the past.

Competition from atomic energy, fuel cells, and shale oil will probably not have much impact in the immediate future, but possibly by 1965 or later, they, too, may become factors influencing the rate of growth in the demand for petroleum.

The domestic industry, it seems certain, could easily supply the demand expected both in the near future as well as over a much longer period. At present, the domestic industry has a reserve producing capacity of about three million barrels a day, about two and a quarter million barrels of this being in Texas. This reserve producing capacity could be sustained by the drilling of from 41,000 to 50,000 wells a year. With sufficient incentive for drilling, then, our

"During the past 10 years, the gross investment in fixed assets at the Baytown Refinery, not counting chemical facilities, has increased by about 120 per cent...and Humble has spent about $48,500,000 in acquiring and building chemical facilities."

present producing capacity could supply us for many years to come.

For example, known crude oil reserves in the U. S. currently stand at 30 billion barrels. And there is every indication, as Mr. Morgan Davis told the API in November, that the domestic industry can add another 70 billion barrels to our supplies over the next 20 years from known fields and acreage already under lease. This estimate is based on the probability of adding 20 to 25 billion barrels to present reserves through increased recovery, of getting 11 or more billion barrels from secondary recovery projects, and of finding another 35 billion barrels on the 350 million acres of undeveloped leases in this country.

Humble's bright future

The Company has had many problems in the last two years, but the long-range outlook continues to remain bright. We have been going through many adjustments—adjustments caused in part by the recession but primarily resulting from forces within the industry. These forces—such as the sharp reduction in producing days in Texas—have worked a particular hardship upon Humble. However, on the bright side of the ledger, Humble has, in my opinion, the finest organization in the industry, with the will and know-how to continue in this enviable position. From the beginning of this company, Humble's management has always believed—and continues to believe—that our people are our most valuable asset. But all things, whether they are human emotions and loyalties or physical properties, can deteriorate without proper care.

It is in this area of human relations that you as individuals and as supervisors have the greatest responsibility. It is your leadership, your attitudes, and your will to do a better job that will have the greatest effect on the future success of this company.

Our oil and gas reserves are large, and our finding experience continues to be satisfactory. As the demand for petroleum and natural gas increases over the years, we should be in an excellent position to take a major role in supplying the nation's energy needs. We are specially optimistic about the prospects for natural gas. Last year, for instance, natural gas sales accounted for about 15.6 per cent of the Production Department's operating revenues. Just eight years ago, in 1950, natural gas accounted for only 5.2 per cent of these revenues. The prices we received have also improved: from an average of 6.2 cents per Mcf in 1950 to 14.2 cents per Mcf last year.

The Company is very fortunate, we think, in having large natural gas reserves which can be used to help attract new industries to Texas. We believe that not only Humble but the entire state benefits from increased industrial activity. We have therefore tried, whenever possible, to sell our gas in intrastate rather than interstate markets. This has had the additional advantage of minimizing problems of FPC regulation.

At this time, of course, our most important gas project is the King Ranch Gas Plant, which is now under construction near Kingsville. One of the alternate markets for the liquid hydrocarbon stream recovered at this plant will be the Baytown Refinery. This possibility, along with the ever-increasing demand for higher octane gasoline, tends to emphasize even more the need for an economical method for converting low octane hydrocarbons into high octane blend stocks.

Our offshore sulphur leases, which are to be mined by Freeport Sulphur Company under a profit-sharing arrangement, will probably start contributing to Humble's income

Baytown Refinery as it looks today

this year. Freeport's 30 million dollar offshore sulphur installation near Grand Isle is rapidly nearing completion.

Our Alaskan well is now in its 17th month of drilling. This wildcat, our first in Alaska, has run into many difficulties. The weather has been even worse than expected. But in spite of these difficulties, we are now drilling below 13,000 feet, and we should soon know the results of this venture.

In the Dillingham area of Alaska, Humble recently carried out some geophysical work and test hole drilling which resulted in the discovery of a large deposit of iron ore. Testing of ore samples is now being conducted and will be continued through the winter months to determine the economic value of these deposits. This could possibly turn out to be a valuable discovery.

The Company has not yet entered directly into the search for shale oil or for uranium since, in our opinion, we have a better outlet for funds currently available for investment. Our Exploration Department keeps abreast of these opportunities, and if conditions change, it is possible that the Company might become more active in ventures of this type.

Refining is one of the most highly competitive branches of the entire petroleum industry. There are 342 petroleum refineries in the United States and 407 petrochemical plants. And all of them are trying to be a little more efficient than the others.

To maintain Baytown's competitive position, the Company has, during the past 10 years, entered into a building program involving not only expansion but also substantial modernization. During this 10-year period, the gross investment in fixed assets at the Baytown Refinery, not counting chemical facilities, has increased by about 120 per cent. At the same time, the rated capacity of the refinery has increased from 237,000 barrels a day of crude to 282,000 barrels a day—about a 19 per cent increase. Much of the increased investment can be attributed to an effort to produce higher quality products in the most economical manner possible.

This period of expansion and modernization has resulted in about a 20 per cent decline in our refinery manpower

requirements. Ten years ago, in 1948, the number of men required to operate the Baytown manufacturing facilities, including rubber plants and other chemical facilities, was 7,223 people. The manpower currently being used to operate these facilities is 5,188.

This reduction in manpower requirements has been brought about by the installation of modern process equipment and labor-saving facilities, as well as by a reorganization in many phases of our Baytown operation. These things were all necessary in order to meet competition, and this trend, along with other economies, must continue in the future in order for Humble to remain competitive. For example, even though our daily capacity throughput at Baytown has been increased from about 91 barrels per man in 1952 to more than 130 barrels per man in 1958, some of our competitors are doing 10 to 20 per cent better than this. Thus, we must continue to be effective in improving the utilization of our manpower.

Growth of petrochemicals

During the last 10 years, Humble has spent about $48,500,000 in acquiring and building chemical facilities. This compares with $175,300,000 spent on modernizing and expanding the petroleum products portion of the refinery. At present, the gross investment for fixed assets for production of chemicals amounts to about 14.5 per cent of Humble's total gross investment in manufacturing facilities. During the last three years petrochemicals accounted for about 34 per cent of the Manufacturing Department's net income.

The Company is currently entering aggressively into the rapidly developing plastics industry. A new polypropylene plant, with a capacity of 40,000,000 pounds a year, is scheduled for completion late this year. Polypropylene will give us a new low-cost material suitable for many varying applications in consumer and industrial items.

The future of petroleum-derived plastics is attractive, and we hope our polypropylene work will prepare us for further fruitful ventures in the plastics field. The Company's management, however, will continue to evaluate very carefully each new petrochemical proposal on the basis of potential profits in comparison with the risks involved.

Keeping up with competition

Over the years, Humble people have turned in many fine achievements. Improved efficiency in all departments, one of the best safety records in the entire industry, considerable progress in improving utilization of manpower and in holding down costs—these are some of the ways in which you have helped the Company remain competitive in a fast-moving industry. This same dynamic approach must be continued if we are to keep abreast of our many alert and vigorous competitors.

Executive management cannot always be fully aware of the various problems which may exist throughout the Company. Departmental management bears a responsibility, not only for operating in the most efficient manner possible, but also for developing plans for future operations. Executive management can offer counsel and make the final decisions, but the responsibility for making the proper recommendations must reside in the individual departments.

It is important that each of you concentrate on making Humble's operations a model which others will seek to follow. It is not a job that any one person can do. It is one which calls for the full and coordinated effort of each individual employee working as a member of the team. It is equally important that every man put in a full day's work for a full day's pay, but without good leadership this goal cannot be realized.

More and more industry spokesmen are touching these days on the subject of the industry's political problems. Should a company such as Humble enter more actively into the field of politics? My own views are simply this: I think political action is a matter for each individual to decide—a matter of exercising one's own enlightened and considered judgment and taking into account one's own interests and the interests of his company. In other words, every man should learn as much as possible about the issues at hand and then go out and vote his own personal convictions.

Currently on the political horizon are two problems of major concern to our industry. One is a major frontal attack on percentage depletion, and the other is the proposed increase of two cents in the federal tax on gasoline. It behooves us all to study these issues carefully and do what we can to bring about a better public understanding.

Importance of communication

All of us, as individuals, like to know what's going on in the Company and in the industry. But communication is more than that. We also like to know how we are getting along with the boss. We like to know that we can talk to him and that he will listen to our views. He doesn't have to agree with us, but we need to know why he doesn't. We all like to know if the work we are doing is effective and if not, how we can correct our efforts so that we can become a more constructive member of the team.

Your effectiveness as supervisors depends to a very large extent on your ability to keep employees informed on matters affecting them. It also depends on your ability to create a work climate which will encourage employees to let you know how they think and feel.

In conclusion, let me say that the effectiveness of all of us in management is determined by how well we meet and solve the Company's problems.

The continued success of Humble depends, as I have said before, on our individual efforts. Most certainly there should be no major differences between management and employees insofar as over-all objectives are concerned. What is good for our employees is good for Humble, and the reverse is equally true. Honest differences of opinion will always arise, but if each of us makes a real effort to understand the other's point of view and tries to be objective in his thinking, such differences of opinion need not lead to misunderstanding and mistrust. On the contrary, they should lead to greater respect and understanding.

I have been impressed here today, as I have in other supervisory meetings throughout the Company, by the high quality of Humble's supervisory personnel. It is reassuring, because it convinces me that Humble is going to continue to be the kind of company that you and I like to work for. Whether it does or not depends, in the final analysis, entirely on us.

BUBBLES IN THE "ATTIC"

...water in the "cellar"

Unusual techniques for gas and water injection may prove valuable secondary recovery aids

SOME time ago a Humble well in Block 18, offshore from Grand Isle, Louisiana, had to be shut down because it started producing salt water instead of oil. But Company engineers were not surprised; they knew exactly why the well had died. Salt water, pushing up from below and taking the place of oil as fast as it was withdrawn from the reservoir, had finally risen to the level of the well perforations. There still remained a considerable amount of oil in the steeply-inclined reservoir, but it was trapped in the "attic" above the point where the well penetrated the zone. Some of this lost oil could be recovered by drilling or re-drilling another hole to tap the reservoir at a higher point, but that would cost a tremendous amount of money, with no assurance that enough oil could be recovered to make it pay out.

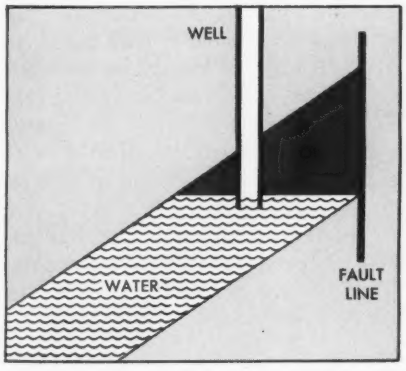
Instead of drilling a new well, engineers decided to try a technique designed to force oil down from the "attic" and make it recoverable through the original single well. This was accomplished by pumping compressed gas down the well. As the gas entered the formation through the well perforations, it bubbled upward through the water and oil and formed a gas cap at the top ("attic") of the reservoir. As gas injection proceeded the gas cap grew and displaced the oil and water downward until the water level once again was below the well production perforations. The gas injection was then halted and oil production was resumed. Later, when the well starts producing excessive salt water again, the gas injection program may be reinstated.

By alternately injecting gas and producing oil, Humble hopes eventually to recover practically all of the "attic" oil in the reservoir. To accomplish this, the Company expects to inject 1,915 million cubic feet of gas into the reservoir. This, it is believed, will result in recovery of about 1,222,000 barrels of crude oil that otherwise could not be recovered by the single well completion in the reservoir.

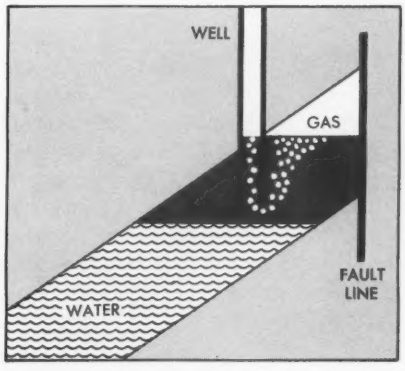
The Company's petroleum engineers also plan to use another type of secondary recovery technique to recover oil left *below* the well perforations in certain similar steeply-inclined reservoirs. This method will be used in reservoirs where salt water does not enter the reservoir to fill the space left by the produced oil. The remaining oil thus is stranded in the "cellar" of the formation with no force to move it upstructure to the well.

To recover this "cellar" oil, Humble will pump salt water into the well for a period of time and then shut down the operation for a while. As the water sinks by gravity downward into the porous formation it will displace the oil, which will rise like cream in a bottle of milk. This action will force the oil level up to the level of the well and oil production can then be resumed.

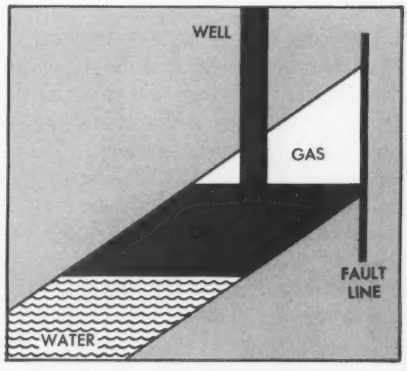
These two secondary recovery techniques are expected to prove most effective in Gulf Coast salt dome fields where reservoirs lie at a steep incline and where the "attics" and "cellars" are quite pronounced. Humble now has under consideration several reservoirs for possible "attic" or "cellar" oil recovery programs. If the projects are successful, it is felt that millions of barrels of otherwise unrecoverable oil will be added to the nation's domestic reserves.



Oil production stopped because water level rose above well's perforations. In that situation, well could produce only water although much oil remained in the "attic."



Compressed gas pumped down into the well formed a cap at top of the reservoir. As the injection program proceeded the gas cap expanded, displacing the oil downward.



When water line once again fell below the level of the well's perforations, the injection of gas into the reservoir was halted. Oil production then was resumed.

Nation's motorists will pay more federal gasoline taxes if Congress enacts new proposal into law. Many states also may hike gasoline taxes.

The state and federal tax burden on gasoline is already staggering. Must motorists now face . . .

MORE

WORD from Washington, D. C. and several state capitals indicates that in 1959 it's "open throttle" for attempts to heap more tax on the gasoline user. If certain proposals are enacted into law, your direct gasoline tax bill may be boosted to about 10 to 12 cents a gallon; maybe more, depending on where you live.

The President has asked Congress to raise the present 3 cent per gallon federal tax on gasoline to an all-time high of 4½ cents a gallon. Additional increases in state gasoline taxes seem almost certain to be proposed in at least 25 state legislatures this year.

The first tax on motor fuel was levied by the State of Oregon back in 1919. Within a decade, every state in the Union had imposed one of its own. The original federal gasoline tax (see accompanying table) was passed as a "temporary" measure in 1932. Since then, the federal tax has been raised four times, twice during national defense emergencies. The last boost of 1 cent came in 1956 to help finance the national highway program.

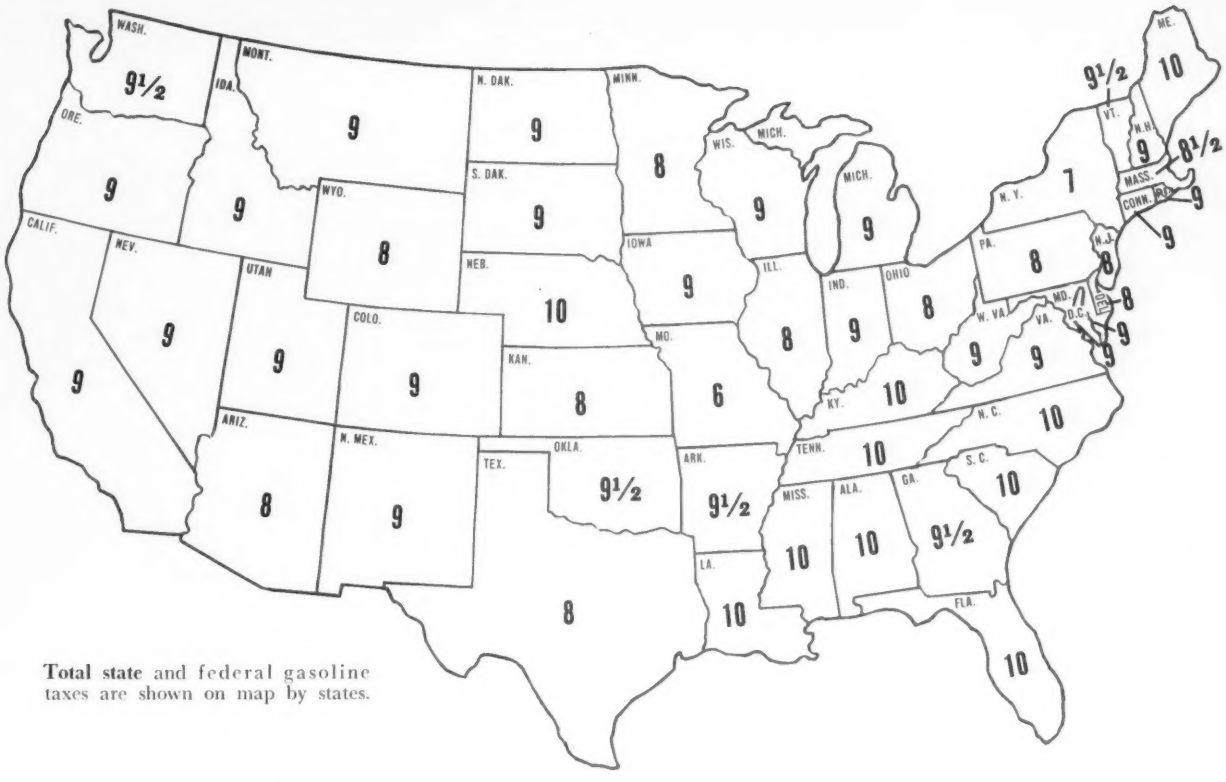
The reason behind the currently proposed federal tax hike is an anticipated $900 million deficit in the Highway Trust Fund next year. Since Congress enacted the Federal Highway Program in 1956, its estimated cost has soared from $27.6 billion to more than $40 billion.

Few motorists debate the importance of the new highway system, but pyramiding state and federal taxes on gasoline are becoming a matter of grave concern to all. Present state and federal taxes on gasoline average 9 cents a gallon. This tax is a greater percentage of the price of gasoline than is imposed on any comparable product in widespread use.

Moreover, there is a real danger that any further increase in these taxes could have the effect of discouraging the use of cars and trucks. This would have serious consequences for highway transportation and ultimately the whole economy. It might well jeopardize the national highway program by retarding the normal growth of highway tax revenues.

Motorists are already paying more than enough in special federal automotive taxes to finance the federal highway program if *all* the money were channeled to road purposes. Last year, for example, $1.5 billion of the $3.6 billion collected in road use taxes were diverted to non-highway functions. Forty-two cents of every dollar collected went to help pay the general costs of government, which road users were also helping pay for in general taxes.

The federal highway plan was enacted as being essential to national defense and the economic well-being of the American people. Programs of this nature are usually paid for out of general tax revenues contributed by all the taxpayers for the reason that they benefit all citizens. But the entire cost of the huge highway program is



Total state and federal gasoline taxes are shown on map by states.

E GASOLINE TAXES?

being borne by the vehicle owner alone.

Offhand, a penny or two more for a gallon of gasoline doesn't seem worth getting disturbed about. But the cost mounts up. Consider that the average motorist already pays $56.76 a year in direct taxes on gasoline alone. That's equal to 41 per cent of the average retail price of the product—a rate four times higher than the federal tax on "luxuries" like mink coats and jewelry. Certainly, gasoline is no luxury.

Present excessive gasoline taxes have contributed greatly to public misunderstanding of the petroleum industry. A large segment of the public feels that the price of gasoline—like that of food, clothing, and other necessities—is too high. Stripped of its taxes, however, the oil industry's basic product is one of the best bargains remaining today. In Texas, for example, since 1925, the price of gasoline has increased only six per cent, and it's a vastly improved fuel. In the same period, taxes on gasoline jumped 319 per cent!

Already, the tax burden on gasoline is staggering. The effects of another increase in gasoline tax could be detrimental not only to the highway program—which depends primarily upon the gasoline tax—but also to other large areas of the national economy. Additional gasoline taxes at this time are unwarranted and contrary to the public interest.

HISTORY OF THE FEDERAL GASOLINE TAX

1932 (June 21) The Federal Gasoline Tax was first imposed as a "temporary" tax of 1¢ a gallon—to provide revenue for meeting the national emergency of the Depression.

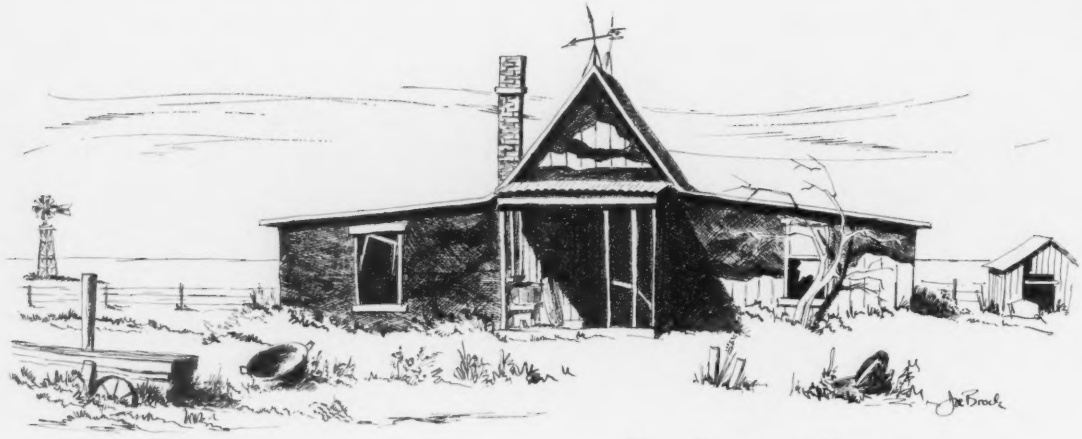
1933 (June 17) Federal Gasoline Tax increased to 1½¢ rate.

1934 (January 1) Federal Gasoline Tax reverted to 1¢ rate.

1940 (July 1) Federal Gasoline Tax again increased to 1½¢ rate—this time for purposes of National Defense (World War II).

1951 (November 1) Federal Gasoline Tax increased to 2¢ rate—this time as a general revenue measure for meeting the emergency of the Korean conflict.

1956 (July 1) Federal Gasoline Tax increased to 3¢ rate—this time to provide the major source of revenue for the Highway Trust Fund created for the expanded Federal Highway Program.



THE DESERTED FARM

. . . a pen and ink drawing by Joe Brock, a scout in the Exploration Department's Amarillo District

HUMBLE'S VERSATILE ARTISTS

Employees and wives provide 132 entries for Art Group's Fourth Annual Invitation Exhibit

MAJA

. . . a sculpture by Miss Jan Vardaman, Scouting Division draftsman in Houston. This took first prize in crafts division.

FOR THE third time in as many years, THE HUMBLE WAY devotes its regular art section and front cover space in this issue to the spare-time works of a number of Humble employees and wives of employees. These art works—oil paintings, water color paintings, pen and ink drawing, and sculpture—represent a cross-section of the entries in the Fourth Annual Invitation Exhibit of the Houston Humble Club Art Group.

This employee art show, which ran concurrently with Oil Progress Week last October at Foley's Town Hall in Houston, was the largest and most successful in the four-year history of the Humble Club Art Group. In quality, quantity, and variety of exhibits, it exceeded all expectations of even such enthusiasts as Al Kaeppel, the president of the group.

There were entries from employees and wives in 15 towns and cities; in addition to the Houston art group, there was representation in the exhibit from other Humble employee art groups at Baytown, Corpus Christi, New Orleans, and Los Angeles.

Fifty-five of these part-time artists entered a total of 132 exhibits—oil paintings, water color paintings, sketches, sculptures, carvings, and other crafts.

Judges Don Bolen, Henry Bracker, and Harry Worthman —all Houston artists—awarded first prize in the oil paintings division to Mrs. Verna Tag, wife of L. R. Tag, a yield supervisor at Baytown Refinery. Her prize-winning painting was the still life, "Gourmet's Delight," reproduced on the facing page. In the watercolors, prints, and drawings division of the exhibit, H. O. Wyneken, geologist in the Corpus Christi office, won top honors with his "Water Nomad," a scratchboard drawing of a water hyacinth. Miss Jan Vardaman, draftsman in the Scouting Division, Houston Office, was awarded first prize in the crafts division for an African sculptured head, "Maja."

"This was the best exhibit we've ever had," says president Kaeppel, "but we're already making plans for an even better one next Fall."

GOURMET'S DELIGHT

. . . an oil painting by Mrs. Verna Tag, member of the Baytown Art Group and wife of Baytown Refinery employee L. R. Tag. This still life painting was awarded first prize in the oil category.

FORT WALTON SHORE

. . . one of three oil paintings exhibited by Robert R. Peale, Production Department supervising draftsman in the Eastern Division office at New Orleans.

PLACID CONFLUENCE

. . . an oil painting by Al Kaeppel, assistant chief draftsman in Exploration Scouting, and president of the Houston Humble Club Art Group. This painting took second prize in the oil section of the show.

WEST BAY DERELICTS

. . . a watercolor painting by Charles Becker of Houston, an employee of Humble Pipe Line Company, engineering section. Judges gave honorable mention to Becker for this painting.

DOGWOOD

. . . an oil painting by Mrs. Shirlie Dauphin of Houston, wife of W. D. Dauphin, auto accident claims division, Law Department. Mrs. Dauphin exhibited five paintings in the show.

L. H. Byrd

J. O. Edwards

Douglas Ragland

Dr. C. R. Hocott

Organization Changes In Production Department

FOUR new managerial positions have been established in Humble's Production Department for the purpose of assisting Department Manager R. C. Barbour in the over-all supervision and coordination of the department's activities.

The new positions and the men appointed to them are: Operations Manager, L. H. Byrd; Administrative Service Manager, J. O. Edwards; Engineering Manager, Douglas Ragland; and Research Manager, Dr. C. R. Hocott.

Mr. Byrd has been assistant superintendent of Humble's Western Production Division at Midland since 1954. As Operations Manager he will assist in planning and appraising current and proposed operations of the Production Department.

He is a graduate of Texas A & M and joined Humble in 1937 as a rotary helper at Talco. Mr. Byrd was California area superintendent for Humble before he was appointed Assistant Division Superintendent at Midland.

Mr. Edwards had been Assistant Controller of Humble since last August. He has now assumed direction of the Production Department's budgeting, clerical, analysis and reporting, and economics and statistics functions and will serve in a similar capacity for the Exploration Department.

A native of Ft. Worth, Mr. Edwards graduated from the University of Texas in 1938. He was employed by Humble's Controller's Department in 1946.

The new Engineering Manager, Mr. Ragland, is responsible for the direction and coordination of the activities of the Petroleum Engineering, Civil Engineering and Gas Engineering Divisions of the Production Department.

Mr. Ragland was serving as Chief Petroleum Engineer before his promotion. He was first employed by Humble as a roustabout in the Conroe Field in 1933 shortly after he graduated from Rice Institute. He is a registered professional engineer.

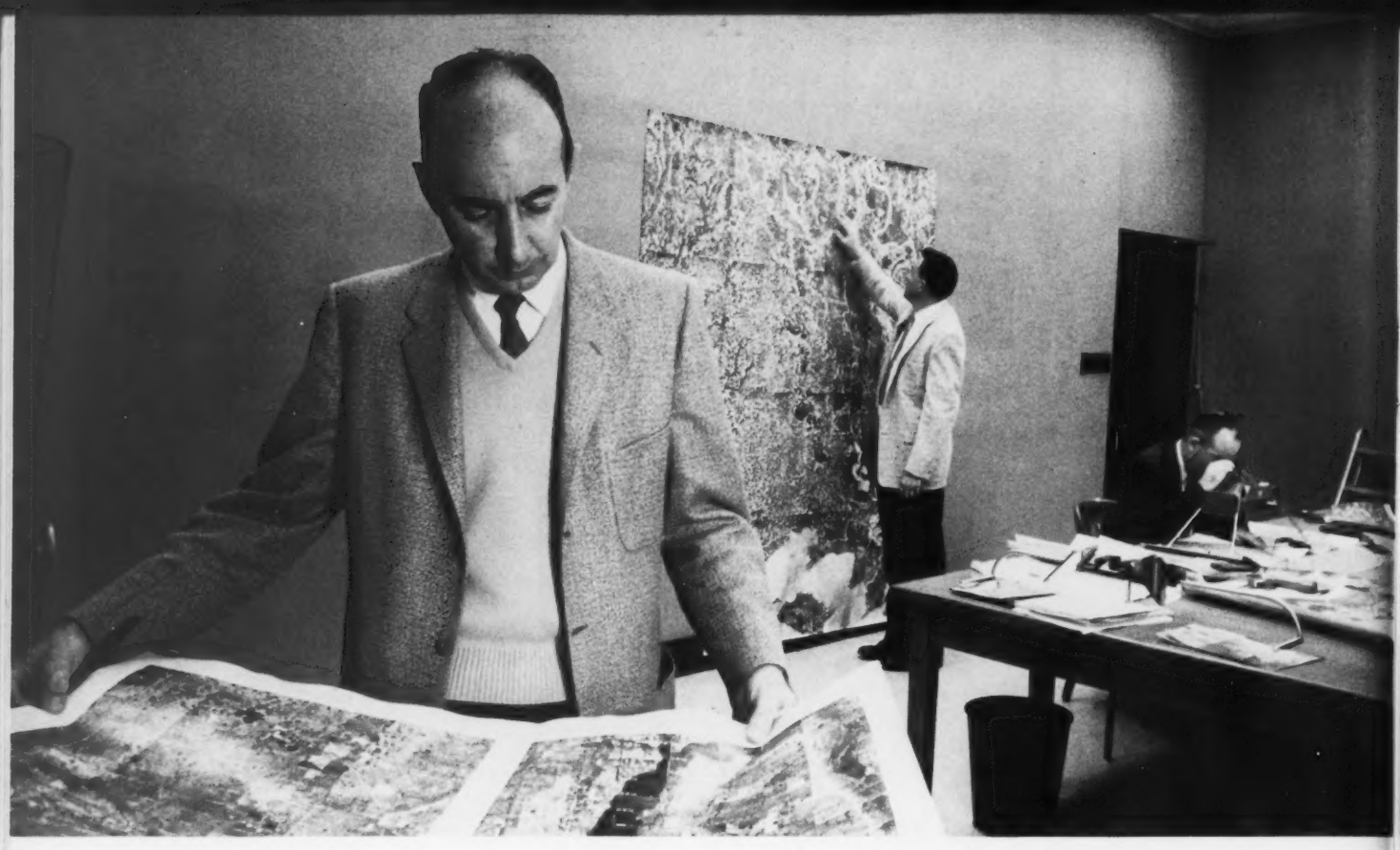
T. A. Huber, Assistant Chief Petroleum Engineer, has been promoted to Chief Petroleum Engineer. Mr. Huber has been with the Company since 1928, having graduated from Ohio Northern University in 1926 and having received his M. S. degree from the University of Pittsburgh in 1928. He is the inventor of Humble's permanent well completion method and has been a leader in the Company's reservoir engineering program.

The Chief Civil Engineer is Harry N. Stamper, a 1922 graduate of the University of Texas. He has served in this capacity since September of 1957. Frank G. Noble is the Chief Gas Engineer. He graduated from Alabama Polytechnic Institute in 1933. He was named to his present position in 1955.

Dr. Hocott, the new Research Manager, has been head of the Production Research Division since 1956. He joined Humble in 1937 as a research engineer in that division.

A native of Excelsior, Arkansas, Dr. Hocott received a bachelor of science degree from the University of Texas in 1933, an M.S. degree in 1934, and a Ph.D. in 1937.

William M. McCardell has been appointed to serve under Dr. Hocott as Chief Research Engineer. Mr. McCardell has been a research specialist. He graduated from Rice Institute in 1948 and received a master's degree from California Institute of Technology the following year. He was employed by Humble in 1949.



Research photogeologists seek out new techniques and criteria for the recognition of structures on aerial photographs. Their science is based on one general premise: that geologic structures buried deep in the earth frequently are revealed by surface indications.

THEY SEARCH WITH

AS EVERY airline traveler knows, the familiar features of the earth's surface take on a new and map-like appearance when viewed from a high altitude. Steep hills seem to flatten out, mighty rivers become mere winding ribbons in a complex drainage system, vast fields of growing crops are reduced to tiny patches in a gigantic crazy quilt. In short, everything looks different from the air.

Taking advantage of this viewpoint, scientists of the petroleum industry now are using aerial photographs to help point the way to new oil discoveries.

Photogeology, as the relatively new science is called, works on the premise that geologic structures deep within the earth often are associated with surface indications. A sharp bend in a stream, for example, may be caused by an infinitesimal bulge of the earth over a hidden salt dome. The color tone and location of vegetation may be the tipoff to a fault or break in the strata below.

By analyzing aerial photos, the photogeologist attempts to spot and interpret the various surface signs pointing to subsurface structures that might contain oil.

Oil men have been using photographs taken from the air for various purposes ever since the 1920's, when they first became available commercially. Geologists valued early mosaics —made by piecing together overlapping photos—primarily as convenient pictures of land surfaces to be explored. By using them, the surface geologist could readily orient himself and plot his data as he walked over the terrain looking for outcrops, faults, seeps, and other features of geologic interest.

Late in the 1920's and early in the 1930's, however, certain geologists noticed that some surface features clearly visible on aerial photographs appeared to bear a close relationship to known subsurface structures. For example, the late Donald Barton, a geologist who subsequently joined Humble, found that certain streams in a South Texas area ran directly alongside known faults. These drainage lines were quite conspicuous by their straightness and apparent independence of the valleys, ridges, or uplands which they crossed.

He also noticed that certain fault lines were marked by other physical features on the face of the earth. If such features were visible where there were known structures, would not sim-

By looking at paired aerial photographs through mirror stereoscope, photogeologist obtains three-dimensional view of terrain.

From an airplane, geologists make visual examination of anomaly they spotted previously on aerial photo.

PHOTOGRAPHS

With aerial mosaics, photogeologists study surface of the earth, seeking clues to subsurface structures

ilar features lead to other structures yet undiscovered? Barton and many other photogeologists following this line of reasoning have come up with some startling results.

Humble geologists today employ various photogeological techniques in the course of their work. In district and division offices from Alaska to Florida they study aerial photos as an aid in searching out new geologic prospects. By analyzing the varied lines and markings on mosaics, the geologists frequently discover they can quickly and effectively narrow an area for more intensive exploration efforts.

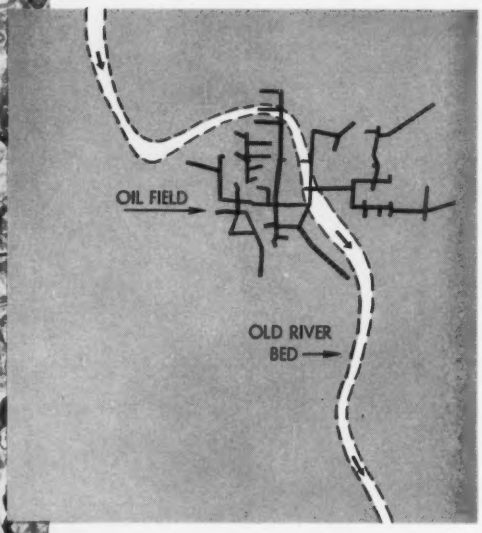
Basic research work with aerial photographs is conducted by a small group of geologists at the Humble Building in Houston. These men attempt to unearth new photogeologic techniques and criteria for recognition of structures on aerial photographs. As part of their work they locate hundreds of known oil fields on mosaics to see what surface indications of structure may be apparent from the air. Another phase of their work is to provide instruction in photogeologic methods, by means of training programs, to geologists in the field and assist them when needed on problems which may arise.

Their work, as they study the photos, is deceptively simple. "In fact, it is almost elementary," says Al Osanik, who heads up Humble's photogeological research group. "But nature, through various geological means, often works simply. We attempt to understand what she has done and why."

As Humble's photogeologists—both in the field and in the research offices—study their mosaics, they look for one thing: an anomaly, a point of irregularity, something on the face of the earth that seems out of kilter with its environment.

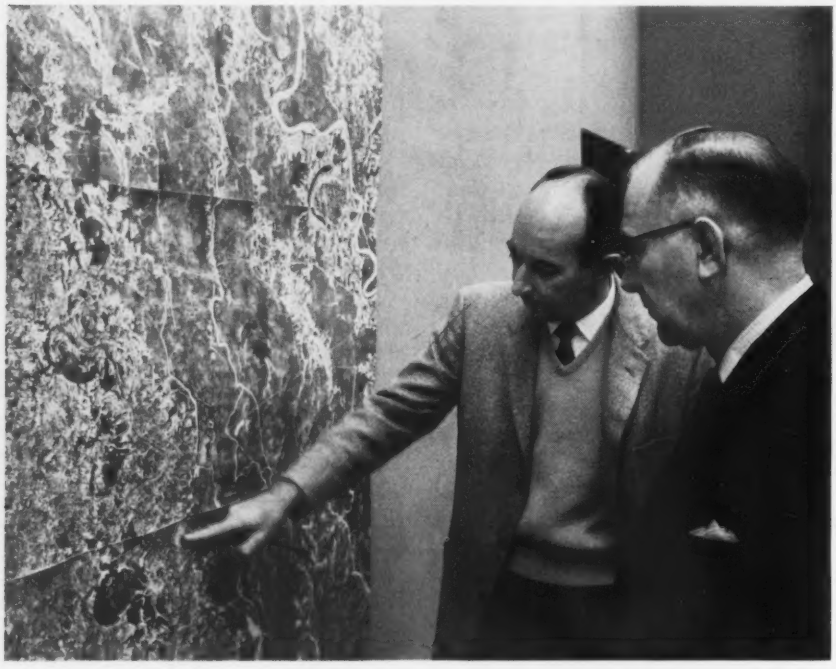
They are interested, for example, in unusual drainage patterns formed by rivers, creeks, streams, and bayous. Geologists for years have realized that a close relationship exists between surface drainage and subsurface structure. They have noticed how many oil fields were discovered at or near the bend of a creek or river. Indeed, many early-day wildcatters staked hard cash and reputations on finding oil by means of "creekology." Although long since superseded by more scientific methods, this exploration technique has regained much prestige in recent years as a result of its union with photogeology.

Its success lies in the fact that water seeks its own level and every stream attempts to take the most direct route



Structural anomaly is indicated by curve in old river bed. Slight domal feature at surface caused river to veer sharply.

Aerial mosaic shows Lafitte oil field in southern Louisiana nestled in bend of ancient distributary of Mississippi River. Sketch at upper right simplifies river and field locations.



Large mosaics made from many overlapping photos allow photogeologists to scan hundreds of miles at a time. At top right of this mosaic is Mississippi River; near center is Atchafalaya.

to the sea. If it comes to an obstruction, the stream likely will change its course to bend around it. The significance of this is that some obstructions are structurally caused, such as the rise of land over a salt dome.

You can see a good example of this at Avery Island Field in Louisiana. The bayou flows toward the salt dome, but as it encounters the dome's higher elevation, it skirts the area in a wide half circle. Past the dome, the bayou once again resumes its normal route.

SOMETIMES a twist or turn in a dusty, abandoned river bed attracts the eye of a Humble photogeologist. An anomaly of this sort shows up clearly in an ancient, abandoned course of the Brazos River south of Houston. Aerial photos show that thousands of years ago the river deflected southward from its normal east-west trend to swing sharply around a structure now known as the Pierce Junction salt dome. Other salt dome structures such as the Clear Lake and Orchard fields caused similar deflections on river beds.

But rivers and streams aren't the only points of interest for a photogeologist as he scans an aerial photograph. There are many other natural features clearly visible on a mosaic that can be interpreted in terms of structures that might trap oil.

From the preceding, it might appear

that all a photogeologist need do to find an oil field is haul out his maps, peruse them for a few minutes until he finds an area of suspicion, then "x" it for a wildcat well. This, unfortunately, is not so. For apparent irregularities or anomalies on the surface of the earth—as seen on aerial photographs—do not always indicate subsurface structure. Nature often causes rivers to wander, or vegetation to grow in unusual ways without any readily apparent reason. Thus, for a photogeologist to be able to interpret an area accurately, he must learn what is geologically normal. Only then can he spot what is abnormal.

AFTER much study, a photogeologist may discover that the path of a river curved because of normal erosion, differences in rock resistance, landslides, or other non-structural factors. Other types of anomalies also may have non-structural explanations.

One of the more interesting of these "natural anomalies" occurs in a region along the Atlantic Coast. Several inland streams in that area seemingly begin from nowhere, run parallel to the ocean for several miles, then abruptly turn. A photogeologist unfamiliar with the area might suspect this to be a drainage anomaly. Yet, the streams do not point out structure; they merely mark the low places between prehistoric beach ridges which in turn reflect former positions of the Atlantic Ocean shoreline.

Photogeology will not, of course, supplant other methods of obtaining geological information. It does, however, serve in many places as an excellent short cut in determining areas for more thorough examination. Used in connection with surface geology, subsurface geology, and geophysics, the work of the photogeologist can be a valuable aid in the search for oil and gas.

In the future, as their science becomes more precise, photogeologists hope they can be more definite, perhaps even to the stage of pinpointing specific drilling sites if the need should arise.

It is small wonder that oil men have a growing interest in photogeology. Much still remains to be learned about it, but already this merger of photography and geology has resulted in a valuable addition to the science of finding oil.

Field geologist makes extensive use of aerial photographs and lens stereoscope in exploration work. The overhead view helps familiarize him with area he will cover later by foot.

In New Mexico mountains, geologists obtain a first hand view of area studied previously on aerial photos. Photogeology is particularly valuable in such areas of rugged terrain.

LONESOME WILDCAT

IN the continuing quest for oil, America's wildcatters meet with many more disappointments than they do bonanzas. Each year, generally unnoticed by the public, thousands of exploratory ventures come to a barren end.

One such disappointment was Humble's New Mexico State BA No. 1, spudded in last May and abandoned as a dry hole in December. It was a $490,000 gamble that failed.

Some of the problems involved in the drilling of that well were discussed in the September-October issue of THE HUMBLE WAY (see cut). The brief account of this "Lonesome Wildcat" told about the remoteness of the desert location (90 miles from Deming and 20 miles from a paved road), the difficulties of transportation and communication, the problem of drilling through cavernous formations, and the scarcity of water needed for drilling mud. The article concluded with this thought:

"Maybe this lonesome wildcat will find oil, but most of them don't. If it is a dry hole, only the readers of this brief article and a handful of oil men will ever know of the tremendous amount of money, time, work, and worry that went into it."

We were wrong in at least part of that prognostication. The well *was* a dry hole, but its abandonment elicited more than the usual brief notice, at least in the *Deming Headlight*. Mrs. Noah Scott, a correspondent for that newspaper, wrote a sensitive and understanding article about the wildcat well, its problems, and its disappointments. Her article, which appeared in the December 25 issue of the *Deming Headlight,* tells the story of the well from the viewpoint of a local resident, someone outside the oil industry.

We have asked for, and received, permission to reprint that newspaper article here as a fitting . . .

EPILOGUE TO A LONESOME

DRILLING operations have ceased permanently at Humble Oil Company's No. 1-BA State wildcat well out by the Hatchet Mountains 30 miles south of Hachita.

They worked hard—they went a mighty long way down into the depths of the earth, but they didn't strike oil.

So—Hachita puts aside any notions it may have had of drastic changes in its way of life in the near future. A cow town it has been for many a long year—a cow town it will remain for a spell yet.

The last drilling shift was put in on Friday, December 19, at which time a depth of 14,585 feet had been reached. The bit was in the basement, they said. What was meant by that? The basement is what the earth was made of before any dirt began collecting on it—the foundation, you might say. The drillers have a very expressive name for it—"Suitcase Sand"—when you strike it, you start packing your suitcase—because you're through!

After the last drilling shift was put in, there were three days of electrical logging to be done. This logging is done with very sensitive electrical apparatus that measures the density of the formations that have been passed through—it can differentiate between all the various kinds of strata that make up the formations that have been passed through, be they limestone, shale, sand, granite or whatever. (If you hit granite, when you're drilling, though, that's usually the end of the story right there. It's so hard you have to quit if there is very much of it.)

The Durham Drilling Company crew expected to finish the logging on the evening shift Sunday, December 21 and start plugging the hole with cement Sunday midnight. There will be three plugs in all—one at the bottom of the hole will be one hundred feet in thickness, then one at the end of the eight and five-eighths inch casing, which will be two hundred feet deep, and the last one will be at the top of the hole, and will measure one hundred feet in thickness, the same as the one at the bottom.

Why did that well have to be plugged at three different levels? Federal regulations require drillers to put a plug at the top of every potential pay zone, that is, every zone where it is conceivable that gas or oil might accumulate any time in the future, and blow out. It was simple—once explained.

The actual time required to reach 14,585 feet was eight months and five days. They began on May 13, and called it quits on December 19.

May 13, of course, doesn't measure the real beginning, because moving the rig out there and getting it set up was a man sized job in itself—and long before that, the geologists and surveyors were on the job, measuring outcrops, making calculations, etc.

The going has been long and hard, compared to other areas, where a hole of like depth could have been drilled in ninety days or so. Usually the first part of the drilling of a well is the fastest, but in this case, just the opposite has been true.

The crew got in their fastest drilling at between 12,000 to 14,000 feet. They had a good bit of trouble with cavities in the first part of the drilling—then they were plagued with deviation trouble—the bit wanted to get off line and wander—making a crooked hole—instead of going straight down, like it should. But, of course, the deeper down they went, the less deviation trouble they had. With more weight on the drill the less tendency it had to deviate.

The rig will have to be dismantled—all that immense string of 14,585 feet of drill pipe will have to be pulled out of that mighty hole in the ground and laid down on the said ground—but that can wait until after Christmas. The men will take time off for

Night and day for more than eight months, drilling crews operated this rig at Humble's remote wildcat location. Result: a $490,000 dry hole.

IE WILDCAT

By Mrs. Noah Scott

Reprinted from the Deming Headlight

that. Which will be something. For ordinarily they work seven days a week and holidays are not excepted.

Where will they move the rig from here? That remains to be seen. Just wherever the next job turns out to be. Could be Hobbs—or back to Texas—there is no telling right now. Could be just about anywhere. That is the drawback with these drilling jobs—you never know where you will be going next—till you are practically on your way.

The drillers say they liked being in our part of the world. Chief tool pusher Julian L. White stated that they are grateful for the wonderful cooperation they have received from everyone they've had any dealings with concerning the job here, both in Hachita and Deming. He said they have had the best cooperation they have ever had on any job. He especially praised the ranchers—the Diamond A's and the U-Bar's—mentioned the friendliness of the Doak Heard's, who were their near neighbors out at the rig.

Hachita will miss the oil workers—they are a friendly lot, themselves. And Deming will miss them, too, since practically all—if, in fact, not all—of them had made their homes in Deming while the drilling was going on. They had settled down as an integral part of the community, children in school, families joining our churches, taking an active part in the vital affairs of the town—making a real contribution, just as if they were going to live here always. Now they've checked their youngsters out of school, and are winding other affairs up as rapidly as possible.

It was said—when they first came—that there would be two or more wells drilled here—whether the first one paid off or not—but no one in authority confirms that information at all.

Anyway, the drilling of Humble Oil & Refining Company No. 1-BA State passes into history, just as its predecessor did a few years back, and not too many miles away.

There may still be oil there—somewhere, but as has been the case in this area for at least the past 40 years, that remains to be seen.

STORY BEHIND THE STORY

Why does Humble take such risks as the $490,000 dry hole described in the accompanying article? Why does it continue year after year to hazard the Company's money on such drilling, when it knows that it might lose as much as $61,000,000 on dry holes in a single year and when industry experience indicates that only one new field wildcat in 44 will find enough oil to be profitable?

The main reason is that these risks have to be taken to satisfy the need of our customers and to stay in business. Humble must continually replace the oil which is currently being produced by hunting for new reserves. The petroleum industry must locate adequate new reserves for national security as well as for economic progress. Finally, Humble takes part in this unending search in hope of making a profit.

The percentage depletion provision of the income tax law is essential to this search. It cannot lessen the impact of an expensive dry hole, but it does provide an incentive for the wildcatter to try again. Without percentage depletion as it has been maintained for 33 years, New Mexico's "lonesome wildcat" and thousands of its counterparts might never have been drilled.

Without assurance that percentage depletion will be maintained at its present rate, there would be little incentive to risk large amounts of money against long odds in drilling in many remote areas. The search for oil would be dangerously impaired. And the ultimate loser? The country as a whole—its national defense and its entire economy.

News Notes

Five Per Cent Pay Raise Announced

Humble Oil & Refining Company and Humble Pipe Line Company announced on January 20 a 5 per cent increase, effective January 16, 1959, in the rates of pay of all wage and classified salaried Humble employees not represented by bargaining agencies. The offer of a similar adjustment in wages and salaries was transmitted at the time to the bargaining agencies representing various other groups of Humble employees.

Morgan J. Davis, Humble's president, said the Company granted the increase since it was evident that a general increase in pay will prevail throughout the petroleum industry and because of the Company's policy of paying at least the prevailing rate. But he added that the present pattern of wage increases can only serve to feed an inflationary trend which, in the long run, may prove detrimental to all.

"These wage increases," he said, "come at a time when the petroleum industry is still suffering from production cutbacks and other effects of the recent recession. They come in the face of depressed demand for domestic crude oil, of weakness in prices, and of substantially increased unit costs. We feel that these wage increases may actually defeat their own purposes by contributing to a further spread of inflation and by impairing the industry's competitive position in the energy market."

Exploration Department Changes Announced

As a result of the reorganization of the Exploration Department and decentralization of functions and responsibilities to the operating divisions, the following personnel changes have been announced.

A new position of division exploration manager has been established for each of the six divisions, and the former division geologists have been promoted to the posts as follows: R. W. Bybee, Western Division; T. F. Petty, North Texas Division; J. L. Patton, East Texas Division; O. W. Noland, Southwest Texas Division; P. H. O'Bannon, Gulf Coast Division; and E. A. Murchison, Jr., Eastern Division.

The positions of chief and assistant chief of the Seismic Section, Houston Office, have been discontinued. C. S. Fleischmann, former chief of the section, was named assistant division exploration manager of the Western Division. O. D. Brooks, former assistant chief, became assistant division exploration manager of the Eastern Division.

Austin Named Division Marketing Manager

J. W. Austin, former manager of consumer sales in the Houston Office, Marketing Department, has been named manager of the Southwest Division at San Antonio. His appointment became effective February 1.

C. S. Reynolds, who has been serving under Humble's Executive Development Program as manager of the Southwest Division since February 1, 1958, will return to his regular assignment of assistant manager, Southwest Division.

B. P. Robertson, who also has been serving under the Executive Development Program as Houston District manager of the Southeast Division, will succeed Mr. Austin as manager of Consumer Sales, Houston Office.

Construction Starts On Gas Pipeline

Construction started in January on Humble's new 238-mile 30-inch natural gas pipeline from the future site of King Ranch Gas Plant to the Company's Clear Lake Gas Plant near Houston. Panama Inc. of Houston is the contractor on the job.

The new natural gas line will tie in with the recently completed 78-mile natural gas line from Clear Lake to the oil refining and petrochemical plant area at Port Arthur.

The 30-inch line is expected to be completed by 1960. The planned King Ranch Gas Plant will be the largest gas processing and cycling plant in America, with a capacity of about 800 million cubic feet a day.

Bids on this plant were received December 15, 1958, and are now being evaluated.

Connaway Receives Safety Council Award

William J. Connaway Morgan J. Davis

William J. Connaway, an operator at Humble's Jourdanton Gas Plant, has been presented the President's Medal of the National Safety Council for saving a woman's life last July at Lake Buchanan.

The medal is the highest award of the Council and is given for successful resuscitation by artificial respiration of a person whose breathing has stopped from asphyxiation, drowning, or electric shock. Mr. Connaway revived Mrs. R. H. Moses Jr. of Snyder after rescuing her from the lake. He administered artificial respiration for approximately 10 minutes before signs of life appeared.

Humble President Morgan J. Davis presented the medal last December at Company offices in Corpus Christi before a representative gathering of Southwest Division employees and Houston Office executives who were present for a regular management-employee meeting.

Baytown Lab Employees Honored for Safety

Employees in Humble's Baytown Refinery laboratories have been awarded the National Safety Council's "Award of Honor" for operating more than 11½ million man-hours without a disabling injury.

This award is the highest recognition given by the Council. It covers the period from April 14, 1947, to June 20, 1958. During this time the more than 500 employees in the combined laboratories — Service Laboratories, Inspection Laboratory, and Research and Development Division — completed 11,736,475 man-hours without an injury.

Presentation of the award was made by H. W. Ferguson, Humble vice president and director.

New Employee Relations Assignments

Several assignment changes in Humble's Employee Relations Department were announced recently.

Wayne H. Haines resumed the position of Annuities and Benefits Division head and secretary of the Annuities and Benefits Committee. George H. Kelley, who had been division head during Mr. Haines' absence, resumed the position of assistant division head. J. H. Gudger was assigned to the newly established post of benefit plans specialist.

The Personnel Placement and Services Division has been established, combining the functions of the Houston Office Regional Employee Relations group and the Personnel Division. A. Ross Rommel was named to head the new division, with George E. Carpenter as assistant division head. R. N. Dyer has been assigned to the newly established position of college relations adviser, and will continue as adviser to the College Recruiting Committee.

J. U. Parker has been appointed acting chief safety engineer, with Homer B. Tippen as acting assistant chief safety engineer.

T. A. Simons III was named assistant regional employee relations manager, Gulf Coast region. J. B. Collerain assumed the duties of assistant regional employee relations manager, North Texas region.

Dr. Franklin Elected Director of AIChE

Dr. W. B. Franklin, head of Technical Division at Baytown Refinery, has been elected to a three-year term as a national director of the American Institute of Chemical Engineers.

In AIChE Dr. Franklin has served as chairman of the Southeastern Texas Section, general chairman of the Section's annual technical meeting, and general chairman of the Houston National Meeting. He has been a member of the society's National Awards Committee three years, and of the Advisory Committee for Chemical Engineering Progress for more than a year.

Recent Retirements

HUMBLE PIPE LINE COMPANY

Name	Location	Date of Retirement	Years of Service
William H. Caudle	Andrews District	December 29	31
Noble N. Fortson	Harbor Island	February 3	32

PRODUCTION DEPARTMENT

Graydon E. Barrow	Friendswood	January 2	36
Floyd W. Chappell	Greta	February 4	31
Coleman B. Haney	Pampa	January 30	38
Bertha V. Henderson	Gulf Coast Division	February 10	38
Clifford D. Merchant	Conroe	January 26	34
Arlie A. Proctor	Avoca	December 31	29
Jack Romine	Goose Creek	February 1	38
Harel B. Ward	Gladewater	February 10	36
Grady W. Westmoreland	Sunniland, Florida	February 12	36

BAYTOWN REFINERY

William R. Brown	Pipe Department	January 5	31
Jesse R. Casey	Storehouse	December 1	34
Edwin Lehr	Garage Department	February 1	28
Thomas J. Rehak	Boilermakers Department	February 10	33
Alfred M. Sralla	Pipe Department	December 1	21

HOUSTON OFFICE

Frank Challie, Jr.	Prod. & Expl. Accounting	December 23	35
Luther A. Kleckley	Prod. & Expl. Accounting	January 5	39
Mike McGinley	Stationery, Printing & Reproduction	February 14	33
Oscar P. McQuatters	Houston Garage	December 20	31
Ruth M. Worrell	Treasury Dept.	November 15	23

Deaths

Employees: Gordon L. Bledsoe, 62, district salesman in Southeast Texas Division office, on January 5; Charles E. Boykin, 64, division clerk in the Pipe Line Southern Division Office in Houston, on January 6; D. D. Dendy, 56, roustabout gangpusher at Tomball District, on November 26; Aubrey Keith Hancock, 44, chief clerk in Personnel Placement and Services Division in the Houston Office, on January 4.

Walter A. Orton, Sr., 62, gangpusher first at Baytown Refinery, on December 16; James W. Reed, 46, senior engineering coordination clerk at Baytown Refinery, on December 30; Herbert A. Sullivan, 52, helper at Baytown Refinery, on November 14; Earl W. Thornton, 26, junior draftsman in Sales Operations & Engineering in the Houston Office, on January 1; Karl A. W. Wenck, Jr., 54, "B" Station operator at Mexia, on December 4; Jesse L. Woodward, 35, welding inspector, Production Department, Southwest Texas, on November 8; Henry F. Wedelich, 64, chief passenger clerk in the Traffic Department in Houston, on November 16.

Annuitants: Robert R. Bains, 67, former labor foreman at Baytown Refinery, on January 2; Durey L. Betts, 65, former lease pumper-gauger at Vernon District, on November 15; Nugent O. Carnes, 57, former area supervisor at Baytown Refinery, on December 8; Osee V. Cunningham, 66, former station foreman at Judkins Station, on November 19.

Hu Marvin Harris, 81, former drilling equipment engineer in Production Operating in the Houston Office, on December 14; John J. Hensley, 66, former roustabout gangpusher at Hardin District, on November 15; Ellis D. Luke, 74, former helper at Baytown Refinery, on December 28; Jimmie W. McKay, 66, former processor at the Specialty Manufacturing Plant in Houston, on December 11.

William C. McManus, 54, former pumper at Maurbro Production District, on December 20; Clyde E. Rodecape, 66, former superintendent of Oil Movement at Baytown Refinery, on January 5; George A. Sawyer, 75, former pumper at Water Station in Talco District, on November 20; Robert Serf, 80, former teamster at Baytown Refinery, on December 1; Arthur L. Slagle, 69, former valve repairman at Baytown Refinery, on January 4.

Elbert J. Smith, 59, former watchman at Pickton, on December 30; James D. Tyree, 79, former pipe machine operator at Baytown Refinery, on November 20; Archie O. Turlington, 72, former warehouse supervisor at Tyler, on December 25; John C. Ulrich, 55, former pipeliner at Satsuma Station, on December 17; Charlie H. Whitmire, 58, former helper at Baytown Refinery, on December 17.

By the way

● In the search for subsurface structures with aerial photographs (see pages 16-19), photogeologists have discovered many intriguing patterns etched on the face of the earth. Two of the more unusual and famous are the portrait of "Lady Halifax," see facing page, and "Burning Tree," below. "Burning Tree" is a classic

photo of the low-lying delta of the Colorado River in Mexico. The Colorado River itself, however, is not shown in the photo. The limb-like patterns are small streams which converge into one main trunk before emptying into the Gulf of California. The photograph, taken at 13,600 feet altitude, was originally obtained as a flood control guide.

● Although "Burning Tree" and "Lady Halifax" both are easily explained in terms of local geology, many patterns seen on aerial photographs are shrouded in mystery. Pictures taken from high over the Everglades of Florida, for example, show long parallel lines drawn across the swamps as if a giant had raked the area with his fingers. Extending from New Jersey to Georgia is a series of egg-shaped ponds and peat fills all pointing in the same direction. Similar depressions, although not as well developed, also are found near Point Barrow, Alaska, and in Refugio and Maverick counties in Texas.

● Seldom do we print letters from HUMBLE WAY readers, but one recent communication from far-off Ghana, in Africa, so charmed our editors that we couldn't resist quoting part of it here. The letter is from Mr. Ayisi Darte of Accra. He writes:

"On a piece of tattered paper, a dismembered leaf of a magazine, 12 years ago, I decried for the first time the name 'Humble.' It was without address but the name struck me and I liked it forthwith. I therefore made a search for the full address and success came with little effort by locating it in Houston, Texas, from a State Department Business Guide; and for the past nine years my post box '65' has been the proud and regular recipient of your esteemed bi-monthly magazine HUMBLE WAY . . . The progress of the Humble Oil Organization is one for admiration and I salute the positive faith and sustained determination of the early pioneers. Your history is a copious source of inspiration to all who wish to think and act big. Reverence to their memory and to the present Directors and Staff my unqualified esteem . . ."

Mr. Darte concluded his letter with this message:

"My greetings and best wishes to the Board of Directors and to the crew of Company Rig 39 my congratulations."

● Most of the entries in the Fourth Annual Invitation exhibit of the Houston Humble Club Art Group (page 10) were conventional art works, but there were also some departures from the conventional.

Two unusual mosaics, for example, attracted a lot of attention. Titled "Butterflies" and "Chanticleer," they were made entirely from beans. Pat Boyles, Exploration Department, created the mosaics without using any artificial coloring, only the natural shades of different kinds of beans.

Another unusual exhibit was a collection of "Gems and Carved Jade" made out of bits of broken soft drink bottles. These beautifully polished "gems" were the work of Kenneth Teller, General Services Department.

The Humble Way

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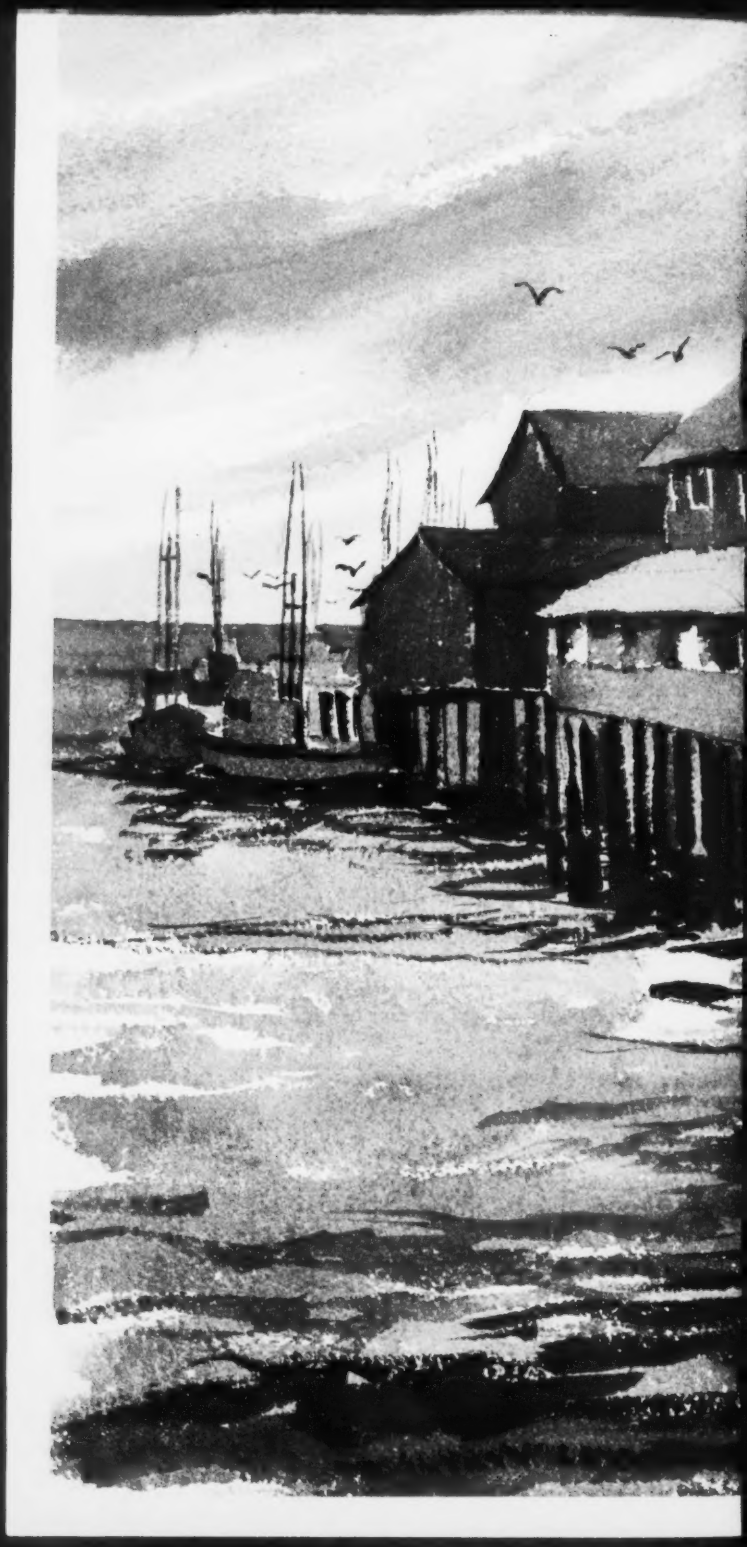
Profile of human head is outlined by stream courses on aerial photo taken near San Marcos, Texas. Drainage patterns on such photos often reveal clues to subsurface geology.



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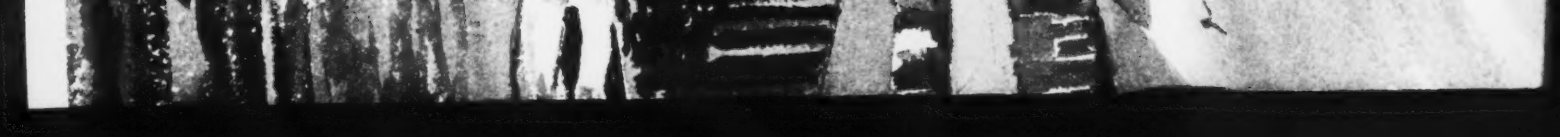
This colorful waterfront scene at Monterey, California, was a spare time painting project of Humble employee Leslie Anderson, draftsman in the Los Angeles office. It was one of the 132 works of art shown by Humble employees and their wives in the 4th Annual Invitation Exhibit of the Houston Humble Club Art Group. More of the art exhibits are reproduced inside.